Amendments to the Claims:

This listing of claims will replace all prior versions, and listings, of claims in the application.

Listing of Claims:

1 - 69. (Cancelled)

70. (New) A process comprising contacting at least one hydrocarbon feedstream with a cracking/selective hydrogen combustion catalyst system under effective catalytic reaction conditions to produce cracked products and uncracked feed comprising liquid and gaseous hydrocarbons, wherein the yield of hydrogen is less than the yield of hydrogen when contacting said hydrocarbon feedstream(s) with said cracking catalyst alone under said catalytic reaction conditions, said process comprising the steps of:

(a) charging at least one hydrocarbon feedstream to a fluid catalytic cracking reactor;

(b) charging a hot fluidized cracking/selective hydrogen combustion catalyst system from a catalyst regenerator to said fluid catalytic cracking reactor, said catalyst system comprising (a) at least one molecular sieve and (b) at least one metal-based component, said metal-based component consisting essentially of a combination of metals selected from the group consisting of:

i) at least one metal from Group 3 and at least one metal from Groups 4-15 of the Periodic Table of the Elements;

ii) at least one metal from Groups 5-15 of the Periodic Table of the Elements, and at least one metal from at least one of Groups 1, 2, and 4 of the Periodic Table of the Elements;

iii) at least one metal from Groups 1-2, at least one metal from Group 3, and at least one metal from Groups 4-15 of the Periodic Table of the Elements; and

iv) two or more metals from Groups 4-15 of the Periodic Table of the Elements;

and at least one of oxygen and sulfur, wherein the at least one of oxygen and sulfur is chemically bound both within and between the metals;

(c) catalytically cracking said feedstream(s) and simultaneously combusting resultant hydrogen in said fluid catalytic cracking reactor at a temperature of from about 300 to about 800°C and a pressure of from about 0.1 to 10 atmospheres in the presence of said catalyst system to produce a stream comprising cracked products and a spent catalyst system which are discharged from said reactor;

(d) separating a phase rich in said cracked products and uncracked feed from a phase rich in said spent catalyst system;

(e) stripping said spent catalyst system at stripping conditions to produce a stripped catalyst phase;

(f) decoking and oxidizing said stripped catalyst phase in a catalyst regenerator at catalyst regeneration conditions to produce said hot fluidized cracking/selective hydrogen combustion catalyst system, which is recycled to the said reactor; and

(g) separating and recovering said cracked products and uncracked feed.

71. (New) The process of Claim 70, wherein said metal-based component is a combination of at least one of oxygen and sulfur, at least one metal selected from Group 3, and at least one metal selected from Groups 4-15 of the Periodic Table of the Elements.

72. (New) The process of Claim 70, wherein said metal-based component is a combination of at least one of oxygen and sulfur, at least one metal selected from Groups 5-15, and at least one metal selected from Groups 1, 2, and 4 of the Periodic Table of the Elements.

73. (New) The process of Claim 70, wherein said metal-based component is a combination of at least one of oxygen and sulfur, at least one metal selected from Groups 1-2, at least one metal selected from Group 3, and at least one metal selected from Groups 4-15 of the Periodic Table of the Elements.

74. (New) The process of Claim 70, wherein said metal-based component is a combination of at least one of oxygen and sulfur and at least two metals selected from Groups 4-15 of the Periodic Table of the Elements.

75. (New) The process of claim 70, wherein said molecular sieve component is at least one zeolite.

76. (New) The process of claim 75, wherein said at least one zeolite is selected from Y, beta, ZSM-5, ZSM-22, ZSM-48, and ZSM-57.

77. (New) The process of claim 70, wherein said effective catalytic reaction conditions include a process temperature of from about 300 to about 800°C.

78. (New) The process of claim 70, wherein said effective catalytic reaction conditions include a process pressure of from about 0.1 to 10 atmospheres.

79. (New) The process of claim 70, wherein said effective catalytic reaction conditions include a process temperature of from about 300 to about 800°C and a process pressure of from about 0.1 to 10 atmospheres.

80. (New) The process of claim 70, wherein said hydrocarbon feedstream comprises at least one material selected from the group consisting of gas oil, steam cracked gas oil and residues, heavy hydrocarbonaceous oils comprising materials boiling above 566°C, heavy and reduced petroleum crude oil, petroleum atmospheric distillation bottom, petroleum vacuum distillation bottom, heating oil, pitch, asphalt, bitumen, tar sand oils, shale oil, liquid products derived from coal liquefaction processes, steam heating oil, jet fuel, diesel, kerosene, gasoline, coker naphtha, steam cracked naphtha, catalytically cracked naphtha, hydrocrackate, reformate, raffinate reformate, Fischer-Tropsch liquids, Fischer-Tropsch gases, natural gasoline, distillate, virgin naphtha, C_{5+} olefins, C_{5+} paraffins, ethane, propane, butanes, butenes and butadiene, olefinic and paraffinic feedstreams.

81. (New) The process of claim 70, wherein said hydrocarbon feedstream comprises at least one material selected from the group consisting of paraffins, olefins, aromatics, and naphthenes.

82. (New) The process of Claim 70, wherein step (C) is characterized by anaerobic selective hydrogen combustion.

83. (New) The process of claim 82, wherein said process is further characterized by producing NO_x emissions and wherein said NO_x emissions are reduced below the level of NO_x emissions resulting from regeneration of the fluidized cracking catalyst without the metal-based component.

84. (New) The process of claim 82, said process is further characterized by producing NO_x emissions and wherein said NO_x emissions are reduced below 50% of the level of NO_x emissions resulting from regeneration of the fluidized cracking catalyst without the metal-based component.

85. (New) The process of claim 70, further comprising a step of regenerating said cracking/selective hydrogen combustion catalyst system, wherein said step is characterized by lower NO_x concentrations in the resulting flue gas than with regeneration of the cracking catalyst alone.

86. (New) The process of Claim 70, wherein the at least one metal-based component comprises one or more of $Y_aIn_bZn_cMn_dO_{x\pm\delta}$, $La_aMn_bNi_cAl_dO_{x\pm\delta}$, $La_aMn_bAl_cO_{x\pm\delta}$, $Sc_aCu_{(1)}Mn_cO_{x\pm\delta}$, $Sc_aZn_bMn_cO_{x\pm\delta}$, $La_aZr_bO_{x\pm\delta}$, $Mn_aSc_bO_{x\pm\delta}$, and $Pr_aIn_bZn_cO_{x\pm\delta}$, with the proviso that positions held by oxygen may optionally be substituted by sulfur, where a, b, c, and d are each between 0 and 1, the sum of a through d equals 1 to 3, x is the sum of a through d plus 1, and δ is the vacancy concentration or excess oxygen/sulfur concentration,

87. (New) The process of Claim 70, wherein the at least one metal-based component comprises one or more of $K_aBa_bMn_cO_{x\pm\delta}$, $K_aMg_bMn_cO_{x\pm\delta}$, $Na_aMg_bMn_cO_{x\pm\delta}$, $Mn_aMg_bO_{x\pm\delta}$, $K_aSr_bMn_cO_{x\pm\delta}$, $In_aCa_bMn_cO_{x\pm\delta}$, $Bi_aCa_bMn_cCo_dO_{x\pm\delta}$, $Bi_aCa_bMn_cNi_dO_{x\pm\delta}$, $Ca_aMn_bSn_cCo_dO_{x\pm\delta}$, $In_aMg_bMn_cAl_dO_{x\pm\delta}$, $In_aZn_bMn_cAl_dO_{x\pm\delta}$, $Na_aBa_bMn_cO_{x\pm\delta}$, $Na_aCo_bMn_cO_{x\pm\delta}$, $Ca_aMn_bSb_cO_{x\pm\delta}$, $Ca_aMn_bCo_cAl_dO_{x\pm\delta}$, $Sr_aSb_bSn_cMg_dO_{x\pm\delta}$, $K_aCo_bMn_cO_{x\pm\delta}$, $Mn_aMg_bO_{x\pm\delta}$, $Ni_aMg_bMn_cO_{x\pm\delta}$, $Mn_aMg_bAl_cO_{x\pm\delta}$, $Mn_aMg_bTi_cO_{x\pm\delta}$, $Sr_aSb_bCa_cO_{x\pm\delta}$, $Sr_aTi_bSn_cAl_dO_{x\pm\delta}$, $Sr_aMn_bTi_cAl_dO_{x\pm\delta}$, $Ca_aMn_bO_{x\pm\delta}$, $Ca_aMn_bO_{x\pm\delta}$, $Ca_aZr_bAl_cO_{x\pm\delta}$, $Bi_aCa_bMn_cO_{x\pm\delta}$, $Bi_aSr_bCo_cFe_dO_{x\pm\delta}$, $Ba_aMn_bO_{x\pm\delta}$, $Ca_aMn_bAl_cO_{x\pm\delta}$, $Ca_aNa_bSn_cO_{x\pm\delta}$, and $Ba_aZr_bO_{x\pm\delta}$, with the proviso that positions held by oxygen may optionally be substituted by sulfur, where a, b, c, and d are each between 0 and 1, the sum of a through d equals 1 to 3, x is the sum of a through d plus 1, and δ is the vacancy concentration or excess oxygen/sulfur concentration,

88. (New) The process of Claim 70, wherein the at least one metal-based component comprises one or more of $La_aCa_bMn_cCo_dTi_eO_{x\pm\delta}$, $La_aCa_bMn_cCo_dSn_eO_{x\pm\delta}$, $La_aCa_bCo_cO_{x\pm\delta}$, $La_aCa_bMn_cNi_dO_{x\pm\delta}$, $La_aCa_bMn_cCo_dSn_eO_{x\pm\delta}$, $La_aCa_bMn_cCo_dAl_eO_{x\pm\delta}$, $La_aCa_bMn_cCo_dO_{x\pm\delta}$, $Ba_aK_bBi_cLa_dO_{x\pm\delta}$, $La_aCa_bMn_cTi_dAl_eO_{x\pm\delta}$, $La_aCa_bCo_cNi_dAl_eO_{x\pm\delta}$, $La_aCa_bCo_cTi_dO_{x\pm\delta}$, $La_aCa_bMn_cO_{x\pm\delta}$, $Ba_aBi_bLa_cO_{x\pm\delta}$, $La_aCa_bMn_cMg_dO_{x\pm\delta}$, $La_aCa_bMn_cFe_dO_{x\pm\delta}$, $La_aSr_bCo_cAl_dO_{x\pm\delta}$, $Ba_aBi_bYb_cO_{x\pm\delta}$, $Ba_aBi_bSn_cLa_dO_{x\pm\delta}$, $La_aCa_bMn_cGa_dO_{x\pm\delta}$, $La_aCa_bMn_cSn_dAl_eO_{x\pm\delta}$, $La_aCa_bMn_cCu_dO_{x\pm\delta}$, $La_aCa_bMn_cCo_dGa_eO_{x\pm\delta}$, $La_aCa_bMn_cAl_dO_{x\pm\delta}$, $La_aCa_bCo_cAl_dO_{x\pm\delta}$, $Ba_aBi_bSn_cLa_dO_{x\pm\delta}$, $La_aCa_bFe_cCo_dO_{x\pm\delta}$, $La_aCa_bMn_cCo_dNi_eAl_fO_{x\pm\delta}$, $Y_aCa_bMn_cO_{x\pm\delta}$, $La_aCa_bFe_cCo_dO_{x\pm\delta}$, and $Sr_aNa_bSn_cY_dO_{x\pm\delta}$, with the proviso that positions held by oxygen may optionally be substituted by sulfur, where a, b, c, d, e and f are each between 0 and 1, the sum of a through f equals 1 to 3, x is the sum of a through f plus 1, and δ is the vacancy concentration or excess oxygen/sulfur concentration,

89. (New) The process of Claim 70, wherein the at least one metal-based component comprises one or more of $In_aCu_bMn_cO_{x\pm\delta}$, $Mn_aCo_bO_{x\pm\delta}$, $In_aZn_bMn_cAl_dO_{x\pm\delta}$, $In_aZn_bMn_cO_{x\pm\delta}$, $Mn_aZn_bO_{x\pm\delta}$, $Mn_aZn_bAl_cO_{x\pm\delta}$, $In_aMn_bO_{x\pm\delta}$, $In_aMn_bAl_cO_{x\pm\delta}$, and $Mn_aZn_bTi_cO_{x\pm\delta}$, with the proviso that

positions held by oxygen may optionally be substituted by sulfur, where a, b, c, and d are each between 0 and 1, the sum of a through d equals 1 to 3, x is the sum of a through d plus 1, and δ is the vacancy concentration or excess oxygen/sulfur concentration,

90. (New) The process of Claim 70, wherein the at least one metal-based component comprises at least one crystal structure selected from perovskite crystal structure, spinel crystal structure, or birnessite crystal structure.

91. (New) The process of Claim 70, wherein said at least one solid acid component comprises at least one molecular sieve selected from the group consisting of crystalline silicates, crystalline substituted silicates, crystalline aluminosilicates, crystalline substituted aluminosilicates, crystalline aluminophosphates, crystalline substituted aluminophosphates, zeolite-bound-zeolite, having 8- or greater-than-8 membered oxygen rings in framework structures.

92. (New) The process of Claim 70, wherein said at least one solid acid component comprises at least one crystalline substituted aluminophosphates selected from the group consisting of SAPO, MeAPO, MeAPSO, ELAPO, and ELAPSO.

93. (New) The process of Claim 70, wherein said effective catalytic reaction conditions include cracking and selective hydrogen combustion at from 475°C to about 650°C.

94. (New) The process of Claim 70, wherein said effective catalytic reaction conditions include cracking and selective hydrogen combustion occurs at from 500°C to about 600°C.

95. (New) The process of Claim 82, wherein step (C) includes cracking and selective hydrogen combustion at from 475°C to about 650°C.

96. (New) The process of Claim 82, wherein step (C) includes cracking and selective hydrogen combustion occurs at from 500°C to about 600°C.

SUPPORT FOR THE AMENDMENTS

Support for the new claims is found *inter alia* as follows: Claim 70 in paragraph [0033] and original Claims 32, 55, and 68; Claims 71-74 in original Claims 32-36; Claims 75-76 in paragraph [0064]; Claims 77-78 is found in original Claims 45 and 46, respectively and for Claim 79 in the combination of these claims; Claims 80 and 81 in original Claims 53 and 54, respectively; Claim 82 in Claim 39; Claims 83-84 in original Claims 56-57, respectively; Claim 85 in original Claim 69; Claims 86-92 in original Claims 5, 9, 13, 17, 18, 26, and 27, respectively. Support for the proviso that sulfur may optionally substitute at the oxygen positions in Claims 87-90 is found at paragraphs 87, 89, 91, and 93. Support for the temperature ranges given in Claims 93-96 is found in paragraph [0124].

It is believed that there is no possibility of new matter and entry and consideration is respectfully requested.